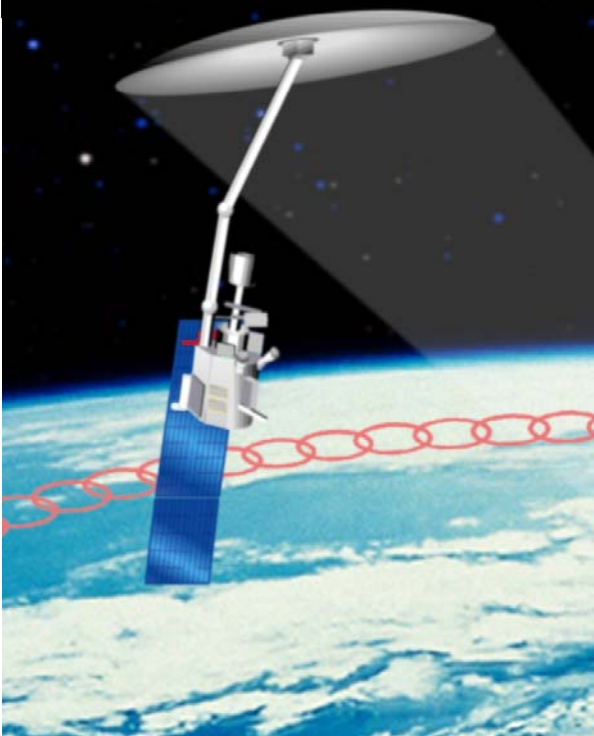


FACT SHEET: The Hydrosphere State Mission

HYDROS - A NASA Earth System Science Pathfinder



Science Return: HYDROS Will Deliver Global Views of Terrestrial Water Cycle
State Variable: Soil Moisture Content and Its Freeze/Thaw State

Soil Moisture is a Variable That Links the Global Water, Energy, and Carbon Cycles

Applications Return: HYDROS Will Bring a New Era for the Capability to Predict Costly Natural Hazards (Extreme Weather, Floods, Droughts)

Initialization of the Soil Moisture State in Numerical Models Extends the Predictability of Processes Influenced by Surface Fluxes

National Security Return: HYDROS Global All-Weather Mapping Supports Battlespace Decision-Making and Force-Enhancement

Air Force

Low-Level Fog and Visibility Forecasts

Army

Terrain Trafficability Assessment

Navy

Sea-Ice Mapping

MEASUREMENT REQUIREMENTS

Spatial Resolution:

Hydroclimatology soil moisture at 40km

Hydrometeorology soil moisture at 10km

Freeze/thaw condition at 3km

Temporal Sampling:

Global in 2-3 days
(2 days Above 50N)

Launch: December 2009



**MISSION
PARTNERS:**

MIT JPL

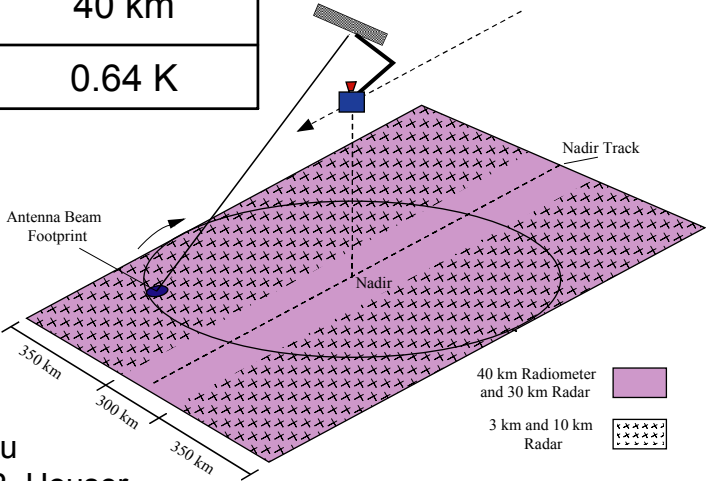


MISSION DESIGN

Orbit: 6 am/pm sun-synchronous at 670 km
Bus: Spectrum Astro SA-200HP
Mission Ops: Spectrum Astro, Inc.
Power: 1283 Watts EOL
Launch Mass: 627 kg
Data Rate: 31 Mbps peak; 26 Mbps average
Telecom: S- and X-band

	Radar		Radiometer
Polarization	VV, HH and HV		V, H and U
Resolution	3 km	10 km	40 km
Relative Error	1.0 dB	0.45 dB	0.64 K

HYDROS instrument scans conically (14.6 rpm) at constant incidence angle over a wide 1000 km swath.



MISSION TEAM

PI: Dara Entekhabi (MIT)
JPL Project Scientist: Eni Njoku
GSFC Project Scientist: Paul R. Houser
Science Team: Stephane Belair (MSC), Wade Crow (USDA ARS), Bert Davis (Army ERDC), Tom Jackson (USDA ARS), Yann Kerr (CESBIO), John Kimball (Univ. Montana), Randy Koster (GSFC), Kyle McDonald (JPL), Peggy O'Neill (GSFC), Terry Pultz (CCRS), Steve Running (Univ. Montana), J.C. Shi (UCSB), Eric Wood (Princeton Univ.), Jakob van Zyl (JPL)

MISSION DATA PRODUCTS

	Product	Resolution	Format	Description	Content
INSTRUMENT	L1A_TB	1-40 km	Half Orbit	Uncalibrated Sensor Data	T_B (K)
	L1A_S0				s^0 (dB)
	L1B_TB	1-40 km	Half Orbit	Calibrated Sensor Data	T_B (K)
	L1B_S0 'lo-res'				s^0 (dB)
	L1C_S0 'hi-res'				s^0 (dB)
SCIENCE	L3_S0	3 km	Gridded	Resampled	s^0 (dB)
	L3_40km_h	40 km	Half Orbit	Radar Product	Roughness; Vegetation
	L2_40km_SM	40 km	Half Orbit	Radiometer	Soil Moisture
	L3_10km_SM	10 km	Gridded	Combined Sensors	Soil Moisture
	L3_3km_F/T	3 km	Gridded	Radar	Freeze/Thaw
	L4_3km_F/T	3 km	Gridded	Analysis	Freeze/Thaw
	L4_5km_4DDA	5 km	Gridded	Data Assimilation	Hydrosphere State